Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

Speedaire® by Dayton® Refrigerated Compressed Air Dryers

Description

Refrigerated compressed air dryers are used to remove moisture from compressed air by cooling compressed air in a heat exchanger to approx. 35°F. This condenses water vapor contained in the compressed air. Water and air are passed through a separator where the condensate is removed and drained off. An air-to-air heat exchanger precools the inlet air and reheats dry air before it leaves the unit.

Models are used to receive and dry air of up to 180°F inlet air temperature and 250 psiG line pressure.

All models will return reheated air to the piping system.

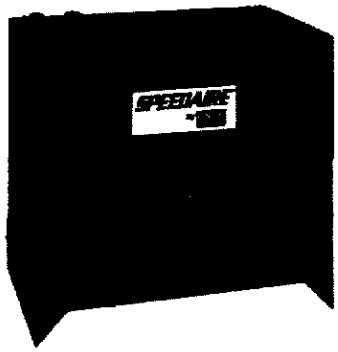

Figure 1 – Model 5Z657E

Specifications

Model No.	HP	Air Flow CFM*	Volts	Max. Fuse	Refrig./ Charge	Dimensions H	W	L	Air line Conn.	Weight Lbs.
5Z656E	1/4	24	115/1/60	15 AMP	R134A/ 20 oz.	16"	22¼"	14"	1"FPT	105
5Z657E	1/2	40	115/1/60	15 AMP	R-22/ 16 oz.	27"	30"	20"	1"FPT	130
5Z658E	3/4	64	115/1/60	15 AMP	R-22/ 3.5 lbs.	27"	30"	20"	1"FPT	180
5Z659E	1	96	230/1/60	15 AMP	R-22/ 5 lbs.	27"	30"	20"	1"FPT	250

NOTE: The air leaving the dryer is reheated to 25°F below the inlet air temp.
Air Flow CFM* based on 175 psiG inlet pressure.

All specifications are based on an inlet air temp. of 180°F, an ambient temp. of 100°F, and an air pressure of 140 psiG. The max. allowable system pressure for each unit is 250 psi. The operating data under the design conditions is as follows above (Specifications).

Unpacking

Dryer is shipped F.O.B. factory. Immediately upon arrival, unit should be checked for possible shipping damage. **If damage is found, report it to the carrier and file damage claim.**

Suction pressure gauge should be checked. If gauge reads zero, it indicates possible refrigerant leak. Notify dealer immediately.

General Safety Information

1. Do not exceed the pressure rating of the dryer, nor any component in your air system.
2. Release all air pressure in your system before attempting to install, repair, or maintain this dryer or any other component.
3. Always disconnect your electrical power source when repairing or maintaining your dryer.
4. Standard equipment is supplied with NEMA 1 electrical enclosures and is not intended for installation in hazardous environments.
5. Air treated by this equipment may not be suited for breathing without further purification. Refer to OSHA standard 1910.134 for the requirements for breathing quality air.

Installation

LOCATION

1. Dryer should be installed so there is sufficient room around the unit to permit circulation of air through refrigeration condensing unit.
2. Locate dryer indoors, in a protected area, where ambient temperature will range between 45° and 100°F.

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Dimensions

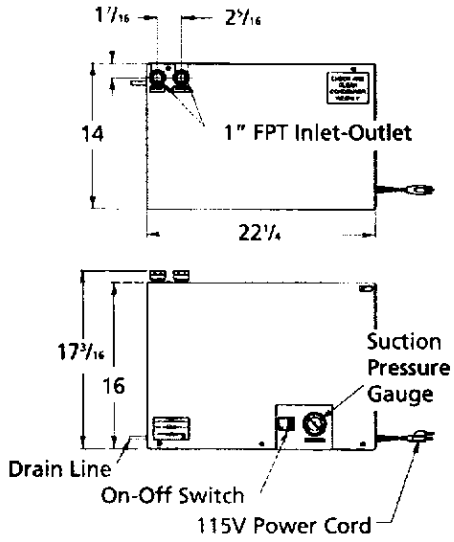

Figure 2 – Model 5Z656E

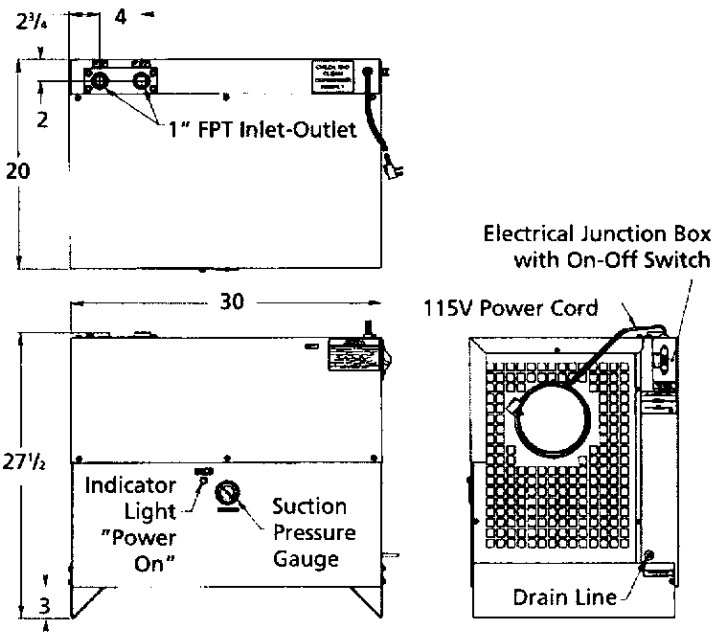

Figure 3 – Models 5Z657E and 5Z658E

Installation (Continued)

INLET & OUTLET CONNECTIONS

1. Connect compressed air lines to inlet and outlet connections marked on the cabinet. Be certain air passes through air dryer in proper direction. On all models, the air lines should be connected with standard pipe fittings.
2. It is recommended that a by-pass line be piped around the air dryer.
3. Shutoff valves should be installed at both inlet and outlet with another valve in the by-pass line. This would permit dryer to be removed from system or serviced without turning off the air.

DRAIN TRAP

1. Condensate separator and automatic drain are used as standard with every dryer.

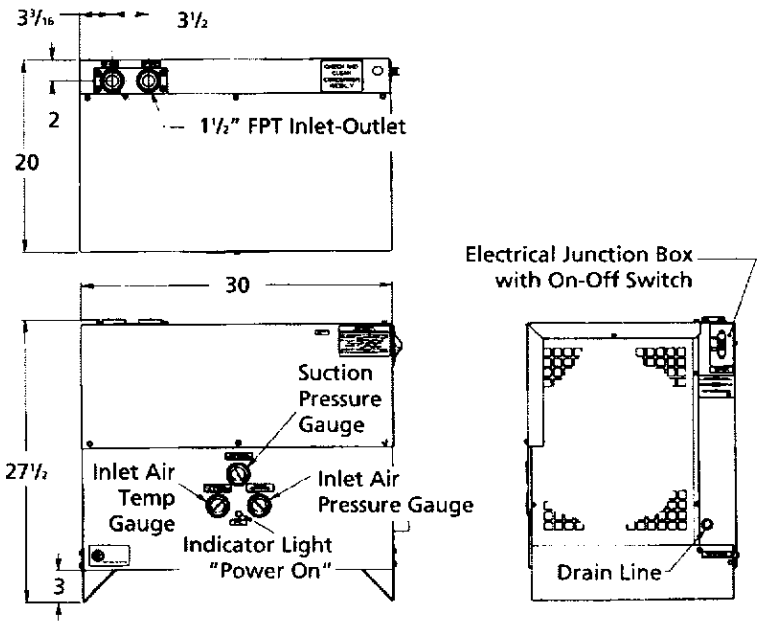

Figure 4 – Model 5Z659E

Models 5Z656E, 5Z657E, 5Z658E and 5Z659E

Installation (Continued)

2. The automatic drain is assembled into the bottom of the separator (See Figure 5). The water, accumulating in the bowl, will lift the float and actuate the drain valve.

SEPARATE/DRAIN ASSEMBLY

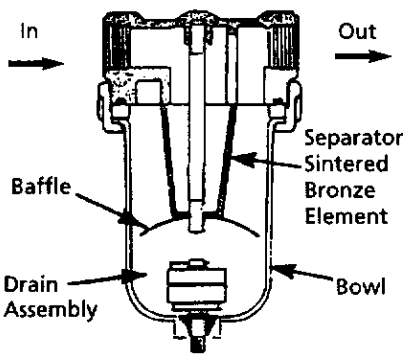

Figure 5 – Drain Trap

⚠CAUTION ***Check nameplate voltage and amperage. Provide a fused line disconnect switch with time delay fuses in accordance with local codes. Dryer should not be fused with air compressor.***

Operation

NOTE: The air dryer is non-cycling and is used to run continuously even under light loads. If a compressed air system remains pressurized and the air compressor cycles on and off to maintain line pressure, the air dryer should remain in operation to keep lines dry.

IMPORTANT: The air dryer must not be cycled with the air compressor.

TO START

1. On initial start-up of system check electrical connections to the dryer, as well as the air piping, so inlet and outlet pipes are connected to correct ports.
2. Check panel mounted suction pressure gauge. It must show a minimum of 70 psi or dryer may not run.
3. When ready to operate the compressed air system the dryer should be started before air compressor is started.

NOTE: All dryer models are designed to operate without compressed air load in order to pre-cool the heat exchanger surface.

4. When closing the start switch the indicator light in front panel of dryer will show there is power to refrigeration compressor. Refrigerant pressure gauge will slowly drop and hold at the no load suction pressure of between 58 and 62 psi (30 to 34 for 5Z656E).
5. When pressure has dropped to this level the air compressor can be started and air flow can begin.

NOTE: Operation of dryer is automatic and continuous. Refrigeration compressor does not cycle off and on. Discharge of condensate through the drain is automatic.

TO STOP

To stop the unit turn start-stop switch to OFF position.

IMPORTANT: If it is necessary to protect the air system during normal shutdown the inlet shut-off valve to the dryer should be closed to prevent wet air from entering air system.

AMBIENT AND INLET AIR TEMPERATURE

The operating conditions important for the best possible performance of the dryer are ambient temperature around the dryer, and inlet air temperature. If ambient temperature exceeds 100°F the dryer could shut down. If inlet air temperatures above 180°F are suspected a line mounted temperature gauge will be helpful to check inlet air temperature and prevent overload of the dryer.

Maintenance

NOTE: Refrigerated air dryers require relatively little maintenance if they are used in accordance with the installation and operating instructions.

CLEANING FIN SURFACE

NOTE: These are air cooled refrigeration systems and depend upon cooling air drawn from the area around the dryer for efficient operation.

1. Inspect the fin surface of the condenser regularly and keep it free of dust, lint, or paper.

NOTE: A vacuum cleaner or a low pressure air hose should be used for regular and normal maintenance of the fin surface.

2. Machine shop applications with oil vapor in the room air may require cleaning with fin surface cleaners (non-acid base condenser coil cleaner) available from refrigeration supply houses.

CLEANING AUTOMATIC DRAIN

All models (See Figures 2, 3 and 4) have an internal float operated drain.

1. Manual discharge from the drain is possible by rotating the brass knurled structure.
2. Accumulation of compressor oil in the bowl of the separator as well as in the sintered bronze element is possible. Both should be cleaned periodically.
3. Remove foam insulator from separator head.
4. Use a strap or chain wrench to remove the ring-nut holding the bowl in place.
5. Drop the bowl and remove it completely.
6. The float can be removed and bowl can be cleaned with detergent and water.

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Maintenance (Continued)

IMPORTANT: Do not clean the float with any kind of solvent even if it is coated with oil. Use detergent or household cleaners only.

REASSEMBLY FOR ALL MODELS

1. Reassemble everything and leave a certain amount of cleaning solution in the bowl.
2. Tighten the ring nut and pressurize the dryer.
3. Manually discharge the solution through drain.
4. If the drain does not work, disassembly and internal cleaning or replacement is recommended.

MINOR SUCTION PRESSURE SETTINGS

Factory settings (58 to 62 psi under no load) (30 to 34 psi for 5Z656E) may change during shipment or occasionally during normal operation conditions. To adjust the suction pressure, proceed as follows:

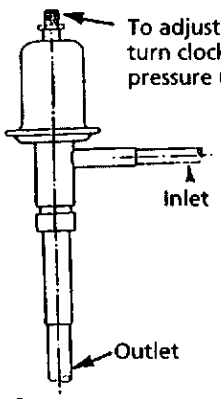
1. Turn off or by-pass the compressed air.
2. Remove the dryer cover and locate the adjustable control valve (See Figures 6 and 7).
3. Turn 1/2 turn at a time and wait 3-4 minutes for suction pressure to settle.
   a. Turn clockwise to increase pressure (temperature).
   b. Turn counterclockwise to decrease pressure (temperature).

HELPFUL MAINTENANCE TIPS

- Keep condenser free of dirt
- Clean drain trap on a scheduled interval
- Maintain suction pressure of 58-62 psi (R-22)
- Maintain suction pressure of 30-34 psi (R-134A)
- Maintain ambient temperature of 45°F - 100°F

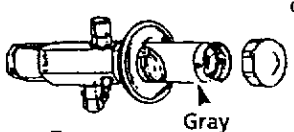
} WITH NO COMPRESSED AIR LOAD

- Clean separator filter element on a scheduled interval
- Do not exceed dryer rated capacity
- Do not cycle dryer with air compressor
- Call service technician with any problems concerning the refrigeration system operation



To adjust refrigeration suction pressure loosen lock nut and turn clockwise to increase, counterclockwise to decrease suction pressure (5Z656E, 5Z657E).

Figure 6



To adjust suction pressure, remove end cap. Using 5/16 allen wrench, turn clockwise to increase, counterclockwise to decrease (5Z658E, 5Z659E).

Figure 7

Models 5Z656E, 5Z657E, 5Z658E and 5Z659E

Troubleshooting Chart

Symptom	Possible Cause(s)	Corrective Action
Unit will not run	1. No power	1. Check power supply, fuses, circuit breaker
	2. Internal compress. Overload open	2. Feel the temperature of the compressor, allow it to cool off if hot. Observe the fan motor. Have the motor checked if it does not run. Clean condenser
Refrigerated suction pressure high (65 psi) (36 psi on 5Z656E)	1. Internal compress. Overload open	1. Check for air overload. Check inlet air temperature. Check operation of fan motor. Check room temperature, hold at 100°F or lower
	2. High ambient temperature	2. Condition ambient air or move to more suitable location
	3. Unit is freezing up	3. Check and clean condenser
Indicator light off	No power to the dryer	Check power supply fuses, circuit breaker
Refrigerated suction pressure low (54 psi) (freeze up) (26 psi on 5Z656E)	1. Low refrigeration charge	1. Have qualified refrigeration service check out dryer or call factory
	2. Low ambient temperature	2. Relocate dryer to heated area at 45°F or higher
	3. Low hot gas valve setting	*3. Readjust hot gas valve to 60 psi suction pressure (See below) (34 psi for 5Z656E)
High pressure drop	1. High air flow	1. Air flow above dryer rated flow
	2. Drain valve not discharging	2. Manually blow down drain until water flow stops. Clean drain
	3. Freezing moisture in evaporator	*3. Adjust suction pressure to 60 psi (See below) (34 psi for 5Z656E)
	4. Plugged separator/drain element	4. Clean or replace
Water downstream of dryer	1. Compressed air is flowing through dryer before it is turned on	1. Dryer must be operating 5-10 minutes before compressed air load
	2. Dirty drain trap	2. Disassemble and clean at regular intervals
	3. Overloading dryer above air flow capacity	*3. Reduce air load to dryer specifications
	4. High suction pressure	4. Inlet air temperature too hot
	5. Low outlet air pressure	*5. Freezing of water adjust suction pressure (See below)
	6. Low refrigerant charge	6. Contact service technician to check leak

NOTE: Checks or repairs of the refrigeration system must be done by a qualified refrigeration service technician with the required gauges and other equipment.

(*) All adjustments must be made under no compressed air load.

For Repair Parts, call 1-800-323-0620

24 hours a day – 365 days a year

Please provide following information:
-Model number
-Serial number (if any)
-Part description and number as shown in parts list

Address parts correspondence to:
Grainger Parts
P.O. Box 3074
1657 Shermer Road
Northbrook, IL 60065-3074 U.S.A.

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Repair Parts List for Refrigerated Compressed Air Dryers

Description	Part No. for Models: 5Z656E	5Z657E
*Gauge, refrig. pressure	91303	91302
Light, assy. power on	–	91322
Switch, on-off	57300	91353
Power cord	90390	91698
Panel, cover	93421G	95416G
Panel, end	93413G	95417G
Panel, back	–	95415G
Panel, base	93419G	95414G
Auto drain	FD06B	FD06B
Drain hose	90350	90350

Description	Part No. for Models: 5Z656E	5Z657E
Water sep. insulation	96524	96524
Water sep. internals	FK329-S1	FK329-S1
Water sep. bowl	3110-S1-8	3110-S1-8
Water sep. bowl O-ring	1560-70	1560-70
*Condensing unit	94820	95826
*Compressor	94917	95924
Overload	91441	91415
Fan motor	94930	95933
Fan blade	97943	95941
Fan switch	–	–
*Hot gas by-pass valve	91221	91221
*Expansion valve	91201	91272S
*Refrigerant filter	91235	91256

(*) Repair parts for refrigeration service only.

Repair Parts List for Refrigerated Compressed Air Dryers

Description	Part No. for Models: 5Z658E	5Z659E
*Gauge, refrig. pressure	91302	91302
Gauge, inlet air temp.	–	103306
Gauge, air pressure	–	91306
Light, power on, assy.	91322	91323
Switch, on-off, 20 amp.	91596	91404
Power cord	91698	–
Panel, cover	95416G	95416G
Panel, end	95417G	95417G
Panel, back	95415G	95415G
Panel, base	95414G	14227G
Auto drain	FD06B	FD06B
Drain hose	90350	90350

Description	Part No. for Models: 5Z658E	5Z659E
Water sep. insulation	96524	96524
Water sep. internals	FK329-S1	FK329-S1
Water sep. bowl	3110-S1-8	3110-S1-8
Water sep. bowl O-ring	1560-70	1560-70
*Condensing unit	96824	97815
*Compressor	96925	97926
Overload	91423	91415
Fan motor	95934	98945
Fan blade	95943	95943
Fan switch	91639	91639
*Hot gas by-pass valve	91233	91232
*Expansion valve	91274S	91165
*Refrigerant filter	91243	91243

(*) Repair parts for refrigeration service only.

Notes

Speedaire® by Dayton® Refrigerated Compressed Air Dryers

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LIMITED WARRANTY

DAYTON ONE-YEAR LIMITED WARRANTY. *Speedaire® by Dayton® Refrigerated Compressed Air Dryer, Models covered in this manual, are warranted by Dayton Electric Mfg. Co. (Dayton) to the original user against defects in workmanship or materials under normal use for one year after date of purchase. Any part which is determined to be defective in material or workmanship and returned to an authorized service location, as Dayton designates, shipping costs prepaid, will be, as the exclusive remedy, repaired or replaced at Dayton's option. For limited warranty claim procedures, see PROMPT DISPOSITION below. This limited warranty gives purchasers specific legal rights which vary from jurisdiction to jurisdiction.*

LIMITATION OF LIABILITY. *To the extent allowable under applicable law, Dayton's liability for consequential and incidental damages is expressly disclaimed. Dayton's liability in all events is limited to and shall not exceed the purchase price paid.*

WARRANTY DISCLAIMER. *Dayton has made a diligent effort to provide product information and illustrate the products in this literature accurately; however, such information and illustrations are for the sole purpose of identification, and do not express or imply a warranty that the products are MERCHANTABLE, or FIT FOR A PARTICULAR PURPOSE, or that the products will necessarily conform to the illustrations or descriptions. Except as provided below, no warranty or affirmation of fact, expressed or implied, other than as stated in the "LIMITED WARRANTY" above is made or authorized by Dayton.*

PRODUCT SUITABILITY. *Many jurisdictions have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from those in neighboring areas. While Dayton attempts to assure that its products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a product, review the product applications, and all applicable national and local codes and regulations, and be sure that the product, installation, and use will comply with them.*

Certain aspects of disclaimers are not applicable to consumer products; e.g., (a) some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you; (b) also, some jurisdictions do not allow a limitation on how long an implied warranty lasts, consequentially the above limitation may not apply to you; and (c) by law, during the period of this Limited Warranty, any implied warranties of implied merchantability or fitness for a particular purpose applicable to consumer products purchased by consumers, may not be excluded or otherwise disclaimed.

PROMPT DISPOSITION. *Dayton will make a good faith effort for prompt correction or other adjustment with respect to any product which proves to be defective within limited warranty. For any product believed to be defective within limited warranty, first write or call dealer from whom the product was purchased. Dealer will give additional directions. If unable to resolve satisfactorily, write to Dayton at address below, giving dealer's name, address, date, and number of dealer's invoice, and describing the nature of the defect. Title and risk of loss pass to buyer on delivery to common carrier. If product was damaged in transit to you, file claim with carrier.*

Manufactured for Dayton Electric Mfg. Co., 5959 W. Howard St., Niles, Illinois 60714 U.S.A.